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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,291	12/09/2003	Ke Liu	C-2775AHyS	4920

7590 04/07/2005

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EXAMINER	
RIDLEY, BASIA ANNA	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/731,291	LIU ET AL.	
	Examiner	Art Unit	
	Basia Ridley	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 December 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

- inconsistent numbering of elements, e.g. "fixed orifice 38" (P5/L8) and "a line 38" (P5/L17).

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

Drawings

2. The drawings are objected to because it is not clear process stream in line 32 mixes or not with process stream in line 23 (Fig. 1).

3. The drawings are objected to because Fig. 2 contains an unidentified process streams (process streams leaving element 36, 36a, 36b).

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d), and/or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Analysis

5. Claims 4-13 recite "a system" which does not clearly indicate which statutory category of invention is being claimed. It has been determined that these claims are directed to an apparatus and the appropriate principles for interpreting claims for that particular category of invention have been applied.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-6 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Admitted Prior Art (see Fig. 1 and P2/L1-21).

Regarding claims 1-2, Admitted Prior Art (see Fig. 1) discloses a method for providing desulfurized hydrocarbon feed comprising:

- producing hydrogen-rich reformate (31) from the hydrocarbon feed (19) and air (23) in mini-catalytic partial oxidizer (14);
- feeding said hydrogen rich reformate (31) along with the hydrocarbon feed (19) to a hydrogen desulfurizer(17);
- wherein said producing step comprises producing hydrogen-rich reformate (31) from the hydrocarbon feed (19) and humidified air (23).

Regarding claim 3, Admitted Prior Art (see Fig. 1) discloses an apparatus comprising:

- means including a small hydrogen generator (14) for producing hydrogen (31) from the hydrocarbon feed (19) and humidified air (23);

- a hydrogen desulfurizer (17);

- means (30) for feeding said hydrogen (31) along with the hydrocarbon feed (19) to said hydrogen desulfurizer (17).

Regarding claim 4-6 and 8, Admitted Prior Art (see Fig. 1) discloses a system comprising:

- a source of hydrocarbon feed (19);

- a small hydrogen generator (14) receiving said hydrocarbon feed (19) and from said source and providing hydrogen containing reformate gas (31); and

- a hydrogen desulfurizer (17) receiving said hydrocarbon feed from said source of hydrocarbon feed (19) and receiving said hydrogen containing gas (31) from said small hydrogen generator (14);

- further comprising a source of humidified air (23); wherein

- said small hydrogen generator (14) receives humidified air (23) from the corresponding source to produce said reformate gas (31) from said hydrocarbon feed (19) and said air (23);

- said small hydrogen generator is a mini-CPO (P2/L1-5);

- said small hydrogen generator is a mini-ATR (P2/L1-5).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 9-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (see Fig. 1 and P2/L1-21) in view of Louder et al. (USP 3,898,153).

Regarding claims 9-11 and 13, Admitted Prior Art (see Fig. 1) discloses a system comprising:

- a source of hydrocarbon feed (19);
- a source of water (24);
- a small hydrogen generator (14) receiving said hydrocarbon feed (19) and from said source and providing hydrogen containing reformate gas (31); and
- a hydrogen desulfurizer (17) receiving said hydrocarbon feed from said source of hydrocarbon feed (19) and receiving said hydrogen containing gas (31) from said small hydrogen generator (14) and providing a desulfurized hydrocarbon feed (16);
- a fuel processor (Fig. 1) including a reformer (14) receiving said desulfurized hydrocarbon feed (16) and said humidified air (23) and producing hydrogen-containing reformate (13), a water gas shift reactor (26) receiving said hydrogen-containing reformate (13) and water (24) and feeding the resultant gas into a preferential CO oxidizer (27);
- further comprising a source of humidified air (23); wherein
- said small hydrogen generator (14) receives humidified air (23) from the corresponding source to produce said reformate gas (31) from said hydrocarbon feed (19) and said air (23);
- said small hydrogen generator is a mini-CPO (P2/L1-5);
- said small hydrogen generator is a mini-ATR (P2/L1-5).

While the reference does not specifically disclose said hydrogen rich reformate being generated in a first reformer, while the generated desulfurized feed is used in a second reformer,

it would have been obvious to one having ordinary skill in the art at the time the invention was made to add an additional reformer, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Further, it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 124 USPQ 378, 380 (CCPA 1960).

While the reference does not explicitly disclose the system wherein the recycled hydrogen gas from the output of said fuel processor is not required fro said desulfurizer, systems which allow operation without recycle of hydrogen gas from the fuel processor to the desulfurizer were known in the art at the time of the invention, as evidenced by Louder et al. (drawing). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to include valves which will allow for operation without recycle of hydrogen gas from the fuel processor to the desulfurizer, as doing so would amount to nothing more than to operating a known system in a known manner to produce an entirely expected result.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (see Fig. 1 and P2/L1-21) in view of Hershkowitz et al. (USP 5,883,138).

Regarding claim 7, the Admitted Prior Art discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the system wherein the small hydrogen generator is a mini-POX.

Hershkowitz et al. establishes equivalency of various processes which can be used for hydrogen generation, including ATR, CPO and POX (C1/L5-C4/L35). The reference also

teaches that each of the processes has advantages and disadvantages over each other (C1/L49-44). As instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the mini-ATR or mini-CPO of Admitted Prior Art with mini-POX, since such modification would have involved a mere substitution of known equivalent structures. A substitution of known equivalent structures is generally recognized as being within the level of ordinary skill in the art.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (see Fig. 1 and P2/L1-21) in view of Louder et al. (USP 3,898,153) and further in view of Hershkowitz et al. (USP 5,883,138).

Regarding claim 12, the Admitted Prior Art in view of Louder et al. discloses all of the claim limitations as set forth above, but the references do not explicitly disclose the system wherein the small hydrogen generator is a mini-POX.

With respect to Hershkowitz et al. the same comments apply as set forth before.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1-6 and 9-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of copending Application No. 10/369,359. Although the conflicting claims are not identical, claims 1-6 and 9-11 of the instant application are directed to an invention not patentably distinct from invention recited in claims 1-7 of copending Application No. 10/369,359, because said claims 1-6 and 9-11 of the instant application recite only the limitations which are recited in claims 1-7 of copending Application No. 10/369,359.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

15. Claims 7-8 and 12-13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of copending Application No. 10/369,359 in view of Hershkowitz et al. (USP 5,883,138).

Regarding claims 7-8 and 12-13, claims 1-7 of copending Application No. 10/369,359 recite all of the claim limitations as set forth above, but they do not recite the system wherein the small hydrogen generator is a mini-POX or mini-ATR.

With respect to Hershkowitz et al. the same comments apply as set forth before.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

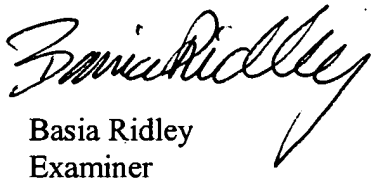
16. In view of the foregoing, none of the claims are allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Basia Ridley
Examiner
Art Unit 1764

BR
April 3, 2005